

AMENDMENTS

In the Claims:

1. (Previously canceled)
2. (Currently amended) Apparatus for joining a plurality of pieces of pipe,
including:

a first piece of pipe and a second piece of pipe each having a similar size and shape
sidewall corrugation pattern along their lengths, said corrugation including a generally repeating
sinusoidal pattern in cross section having alternating portions (a) radially more distant from a
longitudinal centerline of the pipe and (b) radially less distant from that centerline;

a first female engagement structure formed from the sidewall corrugation pattern of the
first piece of pipe, said male engagement structure terminating longitudinally at a location along
the corrugation pattern that is generally within the radially less distant portion of the corrugation
pattern; and

a first female engagement structure formed from the sidewall corrugation pattern of the
second piece of pipe, said female engagement structure terminating longitudinally with a
generally open end for receiving the male engagement structure, said termination occurring at a
location along the corrugation pattern that is generally within the radially more distant portion of
the corrugation pattern,

the first female structure being temporarily deformed to receive the
male structure, the temporary deformation being both sufficiently large to permit the insertion of
the male structure but also sufficiently small to ensure that material memory returns the first
female structure toward its original non-deformed configuration with sufficient compressive

force to grip the male structure and to help prevent its inadvertent removal from engagement with the first female structure, and,

~~wherein the female structure includes an inwardly projecting engagement element at its leading edge acting between said first and said second pieces of pipe to increase the force necessary to disengage said pipe pieces from each other following assembly.~~

3. (Currently amended) The apparatus of Claim 2 or Claim 50, in which said pipe sidewall corrugation pattern of each piece of pipe includes a corrugated exterior surface and an internal non-corrugated liner element.

4. (Previously canceled)

5. (Previously presented) The apparatus of Claim 2, in which said first piece of pipe includes a second female engagement structure remote from said first female structure, said second female structure also being temporarily deformed to function as a female structure for receiving a corresponding non-deformed end of a third piece of pipe, said third piece of pipe having a sidewall corrugation pattern along its length that is similar in size and shape to the sidewall corrugation pattern of said first and second pieces of pipe.

6. (Previously presented) The apparatus of Claim 2, including a sealing element positioned between confronting surfaces of said first and second pieces of pipe to help provide a watertight seal therebetween.

7. (Previously presented) The apparatus of Claim 2, including an adhesive material acting between confronting surfaces of said first and second pieces of pipe to bond said first and second pieces to each other upon insertion of said second piece into said female structure of said first piece of pipe.

8. – 34. (Previously canceled)

35. (Previously presented) The apparatus of Claim 2, further including a stretching tool having a channel into which an edge of said first piece of pipe can be inserted in its originally fabricated shape, said tool including means to temporarily deform said edge of said first piece of pipe.

36. (Previously presented) The apparatus of Claim 35, including a plurality of rollers positionable along the inside and outside surfaces of said edge of said first piece of pipe, and further including means for exerting force to act between said rollers and said edge to deform said edge from its originally fabricated shape to eventually form a first female end.

37. (Previously presented) The apparatus of Claim 2, further including a temporary stretch-holding device having a first portion for temporary insertion into said temporarily deformed female structure of said first pipe piece, said first portion being sized and configured to retain a sufficient degree of deformation of said temporarily deformed female structure so that, upon removal of said temporary stretch-holding device from said temporarily deformed female structure, a non-deformed end of said second piece of pipe may be inserted into engagement with said female structure.

38. (Previously presented) The apparatus of Claim 37, in which said temporary stretch-holding device is fabricated with a sidewall corrugation pattern that is similar in size and shape to the sidewall corrugation pattern of said first piece of pipe, and further including a second portion to assist in desired removal of said device from said temporary insertion into said deformed female structure, said first portion includes a circumferential gap to allow a degree of

compression of said corrugation pattern to facilitate the desired insertion into and removal from said female structure.

39. (Previously presented) The apparatus of Claim 37, in which said temporary stretch-holding device is fabricated with a sidewall corrugation pattern that is similar in size and shape to the sidewall corrugation pattern of said first piece of pipe, and further including a second portion to assist in desired removal of said device from said temporary insertion into said deformed female structure, said second portion includes an axially lengthwise cut to allow a degree of compression of said temporary stretch-holding device to facilitate the desired insertion into and removal from said female structure.

40. (Previously presented) The apparatus of Claim 37, further including a second portion having a strap element upon which force can be exerted to effect the desired removal of said temporary stretch-holding device from said deformed female structure.

41. (Previously presented) The apparatus of Claim 37, further including a second portion having a grippable area upon which force can be exerted to effect the desired removal of said temporary stretch-holding device from said deformed female structure.

42. (Previously presented) The apparatus of Claim 37, wherein said temporary stretch-holding device is sized and configured for use as a cover over a pipe joint formed with said female structure after said device is removed from said temporary engagement within said female structure.

43. (New) A pipe section, said pipe section including a generally longitudinal axis parallel to the flowpath through the pipe section; said pipe section further including a generally sinusoidal exterior surface such that, in section view along the length of the longitudinal axis, said exterior

surface forms a generally sinusoidal pattern of alternating similarly-shaped and similarly-sized (a) rung elements and (b) valley portions; said valley portions generally spacing said rung elements from one another longitudinally with respect to the pipe section's longitudinal axis; said rung elements generally formed in cross section by a central portion lying generally parallel to the valley portion and spaced radially outwardly therefrom, said central portion having in cross section first and second opposing edges spaced longitudinally from each other along the longitudinal axis, said rung elements further generally formed in cross section by first and second leg portions, each leg portion respectively connecting the corresponding edge of the rung central portion to an adjacent valley;

..... a female flange portion at one end of the pipe section, said female flange comprising a portion of a rung including the rung's central portion, said female flange configured to receive a similarly sized and shaped rung element on the end of a similar second pipe section.

44. (New) The pipe section of Claim 43, in which said female flange is formed as an end of the pipe section generally sinusoidal pattern that is terminated generally at or near an longitudinally outermost edge of the central portion of a rung.

45. (New) The pipe section of Claim 43, in which said pipe section includes at the end opposite the female end a male end, said male end formed as an end of the pipe section generally sinusoidal pattern that is terminated generally adjacent a rung near the transition of the leg of the rung into the adjacent valley.

46. (New) The pipe section of Claim 43, in which said pipe section includes at the end opposite the female end a second female end similar to the first female end already described.

47. (New) The pipe section of Claim 43, in which said pipe section female end is formed from a material that (a) permits sufficient expansion of that female end to receive a corresponding male end and (b) has sufficient material memory to snugly engage a male end after it has been so inserted.

48. (New) The pipe section of Claim 43, in which said pipe section includes a central liner element forming a generally straight internal diameter of said pipe section.

49. (New) A pipe section, said pipe section including a generally longitudinal axis parallel to the flowpath through the pipe section; said pipe section further including a generally sinusoidal exterior surface such that, in section view along the length of the longitudinal axis, said exterior surface forms a generally sinusoidal pattern of alternating similarly-shaped and similarly-sized (a) rung elements and (b) valley portions; said valley portions generally spacing said rung elements from one another longitudinally with respect to the pipe section's longitudinal axis; said rung elements generally formed in cross section by a central portion lying generally parallel to the valley portion and spaced radially outwardly therefrom, said central portion having in cross section first and second opposing edges spaced longitudinally from each other along the longitudinal axis, said rung elements further generally formed in cross section by first and second leg portions, each leg portion respectively connecting the corresponding edge of the rung central portion to an adjacent valley; said pipe section terminated generally at each of its two ends with a male end formed generally by a rung element.

50. (New) Apparatus for joining a plurality of pieces of pipe, including:

a first piece of pipe and a second piece of pipe each having a similar size and shape sidewall corrugation pattern along their lengths, and each including a generally longitudinal axis parallel to the flowpath through the respective pipe pieces;

the sidewall corrugation of each of said pipe pieces comprising a generally sinusoidal exterior surface such that, in section view along the length of the longitudinal axis, said exterior surface forms a generally sinusoidal pattern of alternating similarly-shaped and similarly-sized (a) rung elements and (b) valley portions; said valley portions generally spacing said rung elements from one another longitudinally with respect to the pipe piece's longitudinal axis; said rung elements generally formed in cross section by a central portion lying generally parallel to the valley portion and spaced radially outwardly therefrom, said central portion having in cross section first and second opposing edges spaced longitudinally from each other along the longitudinal axis, said rung elements further generally formed in cross section by first and second leg portions, each leg portion respectively connecting the corresponding edge of the rung central portion to an adjacent valley;

a male engagement structure at one end of the second piece of pipe, said male structure formed from the sidewall corrugation pattern of the second piece of pipe, a first female structure formed from the sidewall corrugation pattern of the first piece of pipe at one end of the pipe, said female flange comprising a portion of a rung including the rung's central portion, said female flange configured to receive the male engagement structure of the second pipe piece by being temporarily deformed for receiving the male structure, the temporary deformation being both sufficiently large to permit the insertion of the male structure but also

sufficiently small to ensure that material memory returns the first female structure toward its original non-deformed configuration with sufficient compressive force to grip the male structure and prevent its inadvertent removal from engagement with the first female structure.

51. (New) The apparatus of Claim 3, in which the first female engagement structure constitutes a continuation of the generally sinusoidal pattern of the sidewall corrugation generally without the portion of the pattern transitioning between the radially more distant portion of the corrugation pattern and the radially less distant portion of the corrugation pattern and without the portion of the internal non-corrugated liner element that would otherwise underlie the radially more distant portion of the corrugation pattern.

52. (New) The apparatus of Claim 3, in which the confronting ends of the respective internal non-corrugated liner elements of the respective pieces of pipe generally form a butt joint with each other, said butt joint providing a substantially smooth interior transition surface longitudinally between the respective pipe elements.

53. (New) The apparatus of Claim 3, further including a sealing gasket located between the confronting ends of the respective internal non-corrugated liner elements of the respective pieces of pipe.